APPARATUS, SYSTEM, AND METHOD FOR ELECTRORHEOLOGICAL PRINTING

ABSTRACT OF THE DISCLOSURE

An apparatus, system, and method are disclosed for electrorheological printing. The apparatus includes a pressurized ink chamber, a stimulator, and an electrode arrangement. The pressurized ink chamber is configured to retain an electrorheological ink and, under certain circumstances, discharge the electrorheological ink through one or more nozzles in a nozzle array. The stimulator is configured to generate a synchronization signal to increase the pressure of the electrorheological ink in the pressurized ink chamber. The electrode assembly is configured to create an electric field at each of the nozzles in the nozzle array. The electric field within the volume of a single nozzle acts as an electrorheological valve to change the viscosity and control the flow of the electrorheological ink within the nozzle. The absence of an electric field allows the electrorheological ink to fully discharge. A strong electric field stops the flow of the electrorheological ink. An intermediate electric field slows the flow of the electrorheological ink.

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